

carbapenems and fluorinated quinolones need clinical validation; however, in vitro susceptibility profile appears promising.

Divergent transcription of the *glpTQ* operons between type b and nontypeable *Haemophilus influenzae*

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In eubacteria *Escherichia coli* and *Bacillus subtilis*, the *glpTQ* operon is involved in utilization of glycerol-3-phosphate (G3P) as a carbon source, and the *glpT* and *glpQ* genes transcribe as a single unit. In *Haemophilus influenzae*, we have previously characterized the *glpT* and *glpQ* homologues encoding glycerol-3-phosphate permease and glycerophosphodiester phosphodiesterase, respectively. The protein encoded by *glpQ* is also called Protein D and is involved in pathogenesis. In this study, we analysed the *glpTQ* transcripts in one *H. influenzae* type b (Hib) and one nontypeable (NTHi) strain, and characterized potential function of the 1.4 kb *glpTQ* intergenic region that exists in most Hib strains but not in NTHi strains. In Northern blot and RT-PCR analysis, the *glpT* and *glpQ* genes in the Hib strain transcribed separately, whereas a co-transcribed *glpTQ* was found in the NTHi strain. It suggests that the 1.4 kb *glpTQ* intergenic region in Hib strains partially blocks the *glpTQ* operon transcription. When an isogenic mutant strain where the 1.4 kb region was replaced with a kanamycin cassette in the chromosome of the wild-type strain was tested, the blockage of the *glpTQ* transcription disappeared. We therefore conclude that due to the existence of the 1.4 kb *glpTQ* intergenic region in Hib strains, the *glpTQ* operons between Hib and NTHi strains transcribed differently. Based on a much lower G+C content (26 %) of the 1.4 kb DNA coding region than an overall G+C content of 38 % for the *H. influenzae* genome, we speculate that the 1.4 kb region might have been acquired by lateral transfer from an organism with a lower G+C content.

Catheter-related bloodstream infections (CRBSI) in the immunocompromised host treated by intra-luminal lock-technique (IL)

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Background: The aim of this open, uncontrolled study was to evaluate the reliability of IL for the treatment of microbiologically proven, uncomplicated CRBSI, in different categories of immunocompromised patients.

Methods: IL is based on a daily intraluminal instillation of a pre-definite highly concentrated solution of antimicrobials into the colonized line, locked within the line for at least 12 hrs/day. Then the solution is removed and the CVC eventually re-used. In our study locks were repeated along 14 days. Vancomycin or teicoplanin 20 mg/ml were delivered for empirical locks, or in the presence of staphylococci, enterococci, micrococci and corynebacteria; amikacin 10 mg/ml or ciprofloxacin 2 mg/ml for susceptible Gram-negative bacteria; tailored antimicrobials for Gram-negative with different patterns of chemosensitivity. Fungal CRBSI were excluded. 23 patients, who had signs and symptoms of uncomplicated CRBSI, according to defined criteria, with AIDS (14) or haematological neoplasias (9), and carrying long-term central venous catheter (CVC) (tunnelled or totally implantable), were consecutively enrolled. Per protocol, they were all given locks plus systemic antimicrobial therapy during the first 48 hrs. After this time, once microbiological diagnosis had been proven, clinical reassessment was performed. If defervescence of fever occurred, the patient continued receiving IL alone or in combination with systemic therapy (same antimicrobials used for locks), according to the clinician's decision.

Results: Twelve underwent locks alone and 11 locks plus systemic therapy thereafter. 21/23 pts (91.3%) were cleared from infection and retained the line in place: 12/12 in the IL arm and 9/11 in the IL plus systemic therapy arm, as of clinical and microbiological follow-up performed at 14 days after the completion of treatment. The only two failures occurred in the combined treatment arm and were due to polymicrobial infections (methicillin-resistant *Staphylococcus aureus* plus Gram-negative bacteria), treated with glycopeptide alone-based locks.

Conclusions: This study, though limited, confirms that IL is an effective treatment option also for immunocompromised patients. Furthermore IL alone seems to be at least as effective as IL plus systemic therapy in the treatment of uncomplicated CRBSI, for the high antimicrobial concentrations obtained directly within the site of infection; but it results also in negligible blood antimicrobial concentrations, thus limiting the risk of dose-dependent side-effects and making it appealing in pts with liver or renal impairment as well.

Trends in spectrum and susceptibility patterns of pathogens causing bacteremia in pediatric febrile neutropenic oncologic patients (1998–2002)

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Background: Prospective surveillance of resistant bacterial pathogens is an indispensable tool of quality control in pediatric oncology departments.

Objectives: To analyze trends in microbiologic spectrum and susceptibility patterns of pathogens causing bacteremia in pediatric febrile neutropenic oncologic patients treated with two different empirical antibiotic regimens (ceftazidime (CAZ) plus gentamycin (GNT) during 1998–1999 and piperacillin/tazobactam (TAZ) plus GNT during 2000–2002).

Methods: A retrospective analysis of all bacteremias occurring in patients with fever and neutropenia admitted to the Pediatric Oncology Unit between 1/1/1998 and 28/2/2002.

Results: 81 bacteremia episodes were diagnosed in 40 patients. The most common oncologic diagnoses were leukemia (48%) lymphoma (15%) and bone and soft tissue malignancies (18%). Overall, 130 (33 and 97 during 1998–1999 and 2000–2002, respectively) organisms were isolated: 84 (65%) Gram negative (GmN), 39 (30%) Gram positive (GmP) and 7 (5%) fungi. *Enterobacter* spp. decreased from 18% to 6% ($p=0.05$) and *Klebsiella* spp. increased from 9% to 15% from 1998–1999 to 2000–2002. GmP organisms increased from 24% to 31% ($p=0.07$) from 1998–1999 to 2000–2002: *S. epidermidis* increased from 6% to 13%, *Streptococcus* spp. from 6% to 11% while *S. aureus* decreased from 6% to 0%. There were no MRSA-due bacteremias. 9 (21%) of the 42 *E. coli*, *Klebsiella* and *Enterobacter* spp isolates were resistant to all cephalosporins and to ampicillin/ clavulanate; 7/9 (78%) were isolated during 2000–2002. 9/9, 3/3, 3/9 (33%) and 8/9 (89%) of these isolates were susceptible to imipenem, TAZ, GNT and ciprofloxacin, respectively. Overall pathogen susceptibility to TAZ (30 organisms tested) was higher compared to CAZ (76 isolates)–(94% vs. 82%, $P=0.1$). 22/24 (92%) and 43/54 (78%) of GrN organisms isolated during 2000–2002 were susceptible to TAZ and CAZ, respectively ($P=0.2$).

Conclusions: (1) An increase in the number of GmP organisms was recorded during the last 2 years; (2) An increase in the number of multi-drug resistant *E. coli*, *Klebsiella* and *Enterobacter* spp. occurred during the last 2 years; (3) The initial empiric therapy with TAZ was more appropriate than CAZ in the coverage of most of the pathogens causing bacteremia.

Incidence rates of bloodstream infections in children with long-term central venous catheters at Instituto Nacional do Câncer, Brazil (1995 to 2001)

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Objective: Measurement of Incidence Laboratory confirmed bloodstream infection (BSI) in children with long-term central venous catheters (LT-CVC).

Methods: Cohort of 745 LT-CVCs inserted in children, between January 1995 and July 2001, (main diagnosis, date of insertion, date of removal, LT-CVC type, indica-

tion for removal) and crosslink with blood culture data bank (date of collection, species isolated). Any positive blood culture with a common pathogens (such as *S. aureus*, Gram-negative bacilli, and *Candida* sp) were considered a catheter renal infection (CRI). Common skin contaminants (coagulase-negative staphylococci, diphtheroids, *Bacillus* sp., or *Micrococcus* sp.) isolated from two or more samples and associated with specific treatment or catheter removal, were considered a CRI.

Results: One or more BSI episodes were observed in 52% of LT-CVC. A total of 488 BSI episodes in 194.730 catheters-days (2.51 episodes/1.000 CVC-days). Hickman or Hickman-Broviac catheters had a higher incidence of BSI (3.06/1000 CVC-days) when compared with Port catheters (1.50/1000 CVC-days; OR=2.04; $P<0.05$). Pediatric patients with hematological neoplasia, showed a higher BSI incidence than children with solid tumors. (4.88/1000 versus 1.82/1000 CVC-days, OR=2.68; $P<0.05$). The mean time to the first BSI episode was 124 days (median=75 days).

Conclusion: The incidence of BSI in children with LT-CVC varies according to the type of catheter and the type of neoplasia being treated.

Methicillin-resistant *Staphylococcus aureus* (MRSA) in a general hospital—a ten-year review

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Objectives: We reviewed new patient episodes of colonization/ infection and new episodes of bacteremia caused by MRSA (methicillin-resistant *Staphylococcus aureus*). We investigated the trend of incidence of MRSA in General Hospital Uzice.

Methods: A total of 2255 MRSA were isolated from various clinical samples from January 1991 to December 2001.

Results: The annual rates of MRSA among *S. aureus* increased during the study period from 23.05% in 1991 to 65.11% in 2001 (linear trend of growth, $p<0.01$). The yield of MRSA was the highest from wounds/ulcers/skin swabs accounting for 83.28% while it was 1.86% from blood cultures. The overall incidence of colonization/ infection with MRSA was 1.12/100 (range 0.57–1.52) admissions and 0.98/1000 (range 0.50–1.29) patient-days.

Conclusions: The incidence of MRSA in our hospital is high, average 42.75% and has linear trend of growth.

Prevalence of resistant Gram-negative bacilli (GNB) in nursing homes (NH)

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Ceftazidime resistance (CTZ^R) among GNB is increasing in hospitals worldwide and may be a marker for